

The following reports of waterspouts have been received:

British S. S. *Princess May*, Capt. R. Thompson; observer, W. R. Hunter, Cuba toward Philadelphia.

July 1, 1930, at 12.30 E. S. T., in 34° 01' N., 75° 15' W., a violent squall, reaching force 6 and traveling NE., accompanied by a heavy rain, sheet lightning, and thunder. At this time the barometer read 30.06 inches, temperature of air 79° F., of water at surface 79° F. In rear of squall two waterspouts formed and rose about

20 feet in the air. They both lasted for about three minutes and then subsided.

American S. S. *Fred W. Weller*, Capt. S. Purdy; observer, F. Marcus; Corpus Christi toward Boston.

July 27, 6.50 a. m. Observed two incomplete waterspouts to the eastward of American Shoals Lighthouse (24° 20' N., 81° 40' W.). Both lasted four minutes, then the upper and lower parts did not join. Twenty minutes later heavy showers of rain from the direction of the waterspouts.

### OCEAN GALES AND STORMS, JULY, 1930

| Vessel                  | Voyage       |               | Position at time of lowest barometer |           | Gale began | Time of lowest barometer | Gale ended | Lowest barometer | Direction of wind when gale began | Direction and force of wind at time of lowest barometer | Direction of wind when gale ended | Highest force of wind and direction | Shifts of wind near time of lowest barometer |
|-------------------------|--------------|---------------|--------------------------------------|-----------|------------|--------------------------|------------|------------------|-----------------------------------|---------------------------------------------------------|-----------------------------------|-------------------------------------|----------------------------------------------|
|                         | From—        | To—           | Latitude                             | Longitude |            |                          |            |                  |                                   |                                                         |                                   |                                     |                                              |
| NORTH ATLANTIC OCEAN    |              |               |                                      |           |            |                          |            |                  |                                   |                                                         |                                   |                                     |                                              |
| Porto Rico, Am. S. S.   | San Juan     | New York      | 39 52 N                              | 73 56 W   | July 6     | 10 p., 6                 | July 6     | Inches 29.67     | WSW                               | WSW, 12                                                 | WSW                               | WSW, 12                             | Steady.                                      |
| Oranian, Br. S. S.      | Avonmouth    | Montreal      | 52 40 N                              | 50 08 W   | July 9     | 8 a., 9                  | July 9     | 29.57            | S                                 | S, 4                                                    | S                                 | S, 8                                | Do.                                          |
| Statendam, Du. S. S.    | Rotterdam    | New York      | 40 58 N                              | 61 52 W   | July 11    | 5 p., 11                 | July 11    | 29.71            | SSW                               | SW, 8                                                   | SW                                | SW, 8                               | SSW-S.                                       |
| Induna, Br. S. S.       | Huelva       | Baltimore     | 35 02 N                              | 60 50 W   | July 8     | 9 p., 12                 | July 12    | 29.93            | SW                                | SW, 8                                                   | NW                                | SW, 8                               | SW-NW.                                       |
| Jean Jadot, Belg. S. S. | New York     | Antwerp       | 40 33 N                              | 62 15 W   | July 13    | 4 a., 13                 | July 13    | 29.90            | SSW                               | SSW, 6                                                  | SSE                               | —, 10                               | —                                            |
| California, Fr. S. S.   | Havre        | New York      | 41 07 N                              | 61 12 W   | July 14    | —, 14                    | July 14    | 29.68            | S                                 | S, 2                                                    | SW                                | —, 8                                | SSE-S-SW.                                    |
| Schuykill, Br. M. S.    | Baytown      | Liverpool     | 47 58 N                              | 28 26 W   | July 17    | 3 p., 18                 | July 20    | —                | SSE                               | SSE, 8                                                  | N                                 | —, 9                                | SSE-E-N.                                     |
| Schenectady, Am. S. S.  | New York     | Copenhagen    | 58 25 N                              | 15 40 W   | July 25    | 10 p., 25                | July 26    | 29.35            | SE                                | SE, 8                                                   | SE                                | SSE, 9                              | SE-SSE.                                      |
| Sarcorie, Am. S. S.     | Havre        | New York      | 49 28 N                              | 7 20 W    | July 28    | 4 a., 28                 | July 29    | 29.82            | WSW                               | WSW, 4                                                  | NW                                | W, 8                                | Steady.                                      |
| Do.                     | do.          | do.           | 44 42 N                              | 29 20 W   | July 31    | 2 p., 31                 | Aug. 1     | 29.73            | WSW                               | W, 9                                                    | NNW                               | W, 10                               | WSW-W.                                       |
| Georgia, Dan. S. S.     | Norfolk      | Rotterdam     | 47 26 N                              | 26 12 W   | July 29    | 8 a., 31                 | do.        | 29.51            | SW                                | WNW, 8                                                  | NNW                               | —, 9                                | WNW-NNW.                                     |
| NORTH PACIFIC OCEAN     |              |               |                                      |           |            |                          |            |                  |                                   |                                                         |                                   |                                     |                                              |
| Kentucky, Am. S. S.     | Davao, P. I. | San Francisco | 44 16 N                              | 162 21 W  | July 4     | 4 a., 5                  | July 5     | 29.96            | ENE                               | ENE, 8                                                  | ENE                               | ENE, 8                              | Steady.                                      |
| Pres. Hayes, Am. S. S.  | Manila       | do.           | 17 23 N                              | 140 24 E  | July 7     | 9 a., 7                  | July 7     | 29.88            | ESE                               | ESE, 7                                                  | ESE                               | ESE, 8                              | Do.                                          |
| Tecumseh, Br. S. S.     | Yokohama     | San Pedro     | 38 36 N                              | 155 07 E  | July 10    | Noon, 10                 | July 10    | 29.29            | E                                 | E, —                                                    | ESE                               | ENE, 8                              | E-ESE.                                       |
| Triumph, Am. M. S.      | Newchwang    | Hong Kong     | 26 50 N                              | 122 10 E  | July 13    | Mdt., 13                 | July 14    | 29.14            | E                                 | ESE, 9                                                  | SSE                               | ENE, 9                              | ESE-S.                                       |
| Liberator, Am. S. S.    | Hong Kong    | Honolulu      | 24 04 N                              | 132 32 E  | July 26    | Noon, 26                 | July 26    | 28.97            | NW                                | W, —                                                    | SE                                | W, 8                                | W-WSW.                                       |
| Taiyo Maru, Jap. S. S.  | Yokohama     | San Francisco | 35 06 N                              | 141 45 E  | July 29    | 3 a., 30                 | July 31    | 29.75            | NE                                | E, 7                                                    | S                                 | SE, 8                               | ENE-ESE.                                     |
| SOUTH ATLANTIC OCEAN    |              |               |                                      |           |            |                          |            |                  |                                   |                                                         |                                   |                                     |                                              |
| Brasilien, Dan. S. S.   | Barry        | River Plate   | 29 00 S                              | 46 58 W   | July 14    | 2 a., 14                 | July 16    | 29.84            | SW                                | SW, 8                                                   | WSW                               | WSW, 10                             | SW-WSW.                                      |

### NORTH PACIFIC OCEAN

By WILLIS E. HURD

Pressure conditions on the North Pacific Ocean during July, 1930, were more than ordinarily devoid of gradient, and therefore little conducive to the production of rough weather. Over the greater part of the ocean in middle, and even in higher, latitudes anticyclonic conditions prevailed even more completely than in the previous June, when the North Pacific HIGH covered a large and almost unbroken area. In July the Aleutian Low had practically vanished, and only a few and comparatively unimportant cyclones appeared from time to time in the Bering Sea and in Alaskan waters of the Pacific. Such northern depression as persisted was central considerably to the northward of the Aleutian chain. The departures from the normal barometric pressure, as indicated in the following table, were slightly above in middle and upper latitudes and, as shown by the figures for Honolulu and Midway Island, slightly below in more southern waters.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, at indicated hours, North Pacific Ocean and adjacent waters, July, 1930

| Stations                    | Average pressure | Departure from normal | Highest | Date | Lowest | Date  |
|-----------------------------|------------------|-----------------------|---------|------|--------|-------|
|                             | Inches           | Inch                  | Inches  |      | Inches |       |
| Point Barrow <sup>1</sup>   | 29.84            | —                     | 30.12   | 29th | 29.50  | 20th. |
| Dutch Harbor <sup>1</sup>   | 30.04            | +0.02                 | 30.38   | 5th  | 29.74  | 28th. |
| St. Paul <sup>1</sup>       | 29.92            | +0.07                 | 30.32   | 16th | 29.50  | 29th. |
| Kodiak <sup>1</sup>         | 29.99            | +0.03                 | 30.18   | 6th  | 29.66  | 18th. |
| Midway Island <sup>1</sup>  | 30.07            | —0.01                 | 30.20   | 1st  | 29.94  | 10th. |
| Honolulu <sup>2</sup>       | 29.99            | —0.03                 | 30.07   | 8th  | 29.89  | 13th. |
| Juneau <sup>3</sup>         | 30.08            | +0.03                 | 30.27   | 17th | 29.85  | 3d.   |
| Tatoosh Island <sup>4</sup> | 30.13            | +0.06                 | 30.28   | 30th | 29.94  | 2d.   |
| San Francisco <sup>5</sup>  | 29.96            | +0.01                 | 30.14   | 29th | 29.80  | 3d.   |
| San Diego <sup>6</sup>      | 29.90            | +0.01                 | 30.05   | 23d  | 29.74  | 12th. |

<sup>1</sup> P. m. observations only.

<sup>2</sup> For 24 days.

<sup>3</sup> For 28 days.

<sup>4</sup> For 29 days.

<sup>5</sup> For 30 days.

<sup>6</sup> A. m. and p. m. observations.

<sup>7</sup> Corrected to 24-hour mean.

It is significant that, as deduced from a goodly number of reports, hardly a gale of higher than moderate force occurred along the northern steamship routes. Such a

few higher velocities as were encountered include winds of force 7 met with at points off the California and Washington coasts on the 19th to 21st, a fresh gale that blew on the 5th near 45° N., 160° E., and moderate to fresh gales that occurred near 37° N., 155° E. on the 10th and 11th. In fact, this great region seems to have been quieter this month than during any other similar period or month in many years past.

It was only in Asiatic and adjacent waters that any storm weather of consequence occurred. Reporting steamships encountered moderate gales northwest of Guam on the 7th, about 600 miles east of Taiwan on the 26th, and southeast of Japan on the 30th; also strong southeasterly gales north of Taiwan on the 13th and 14th, all connected with the activities of various typhoons of the month. The report of the American steamer *Liberator* for the 26th showed a fresh west gale in 24° 04' N., 132° 32' E., with barometer as low as 28.97 inches.

In absence of other specific reports of these typhoons at this writing, a brief résumé of their movements, drawn from the Tokyo weather charts, will indicate the stormy character of the weather in the Far East.

A moderate typhoon, which appeared in the China Sea on June 30, went up the China coast and died out in southeastern Siberia on July 5.

A typhoon which originated in the neighborhood of Guam on the 4th, touched northern Luzon on the 11th, crossed Taiwan on the 13th, became apparently violent over the Yellow Sea on the 15th, then lost energy as it proceeded northward.

Following this, a storm came from east of Guam on the 9th. It became violent east of Taiwan on the 15th, and by the morning of the 18th was devastating Kiushu, the southwesternmost island of Japan. By night it was over Chosen (Korea) as a heavy storm, but dissipated inland on the following day. According to press reports, the heavy rains and hurricane velocities attending this typhoon caused the loss of approximately 1,000 fishing craft and a general property loss estimated at \$50,000,000 in Kiushu. Damage also was extensive over Chosen, while altogether the known loss to life latest reported upon was in excess of 400.

On the 18th another typhoon appeared east of Guam. It went rapidly westward, crossing Luzon on the 22d and entering the China Sea. On the 24th it struck Hong Kong with some force, then disappeared in the continent.

The fifth typhoon appeared at some distance north of Guam on the 24th. It attained great violence on the 26th, crossed northern Taiwan on the 28th, and at the end of July still lay over extreme eastern China, causing strong south and southwest winds in the Taiwan Channel and neighboring waters.

The sixth typhoon formed in the wake of its predecessor and was central near 24° N., 144° E., on the 28th. It moved northward, and on the 31st lay over south-central Japan, apparently of moderate energy only and decreasing in force.

No cyclones occurred in Mexican west coast waters this month, but on the 25th, 30th, and 31st moderate northers of force 6 and 7 were reported by seamen in the Gulf of Tehuantepec. Coincident with this occurrence, trade winds of moderate gale force were experienced in the southwestern part of the Caribbean Sea, caused by anticyclonic conditions which extended southward from the United States. Weather of this brisk type is rather unusual at this season in these waters.

At Honolulu the prevailing wind continued from the east, with the highest velocity at the rate of 24 miles an hour from the same direction on the 28th.

Frequent and extensive fog banks formed north of the fortieth parallel, several trans-Pacific vessels reporting their occurrence for an entire week or more at a stretch, unbroken except for brief intervals. Over a considerable region south of the central Aleutians, and extending thence westward almost to the Japanese coast, fog was met with on at least 40 to 60 per cent of the days of the month. Along the northern routes between the one hundred and eightieth meridian and the longitude of 145° W., the occurrence lessened to 20 to 40 per cent. There were several days with fog in Alaskan waters. Off the coast of the United States from Puget Sound to Point Arguello fog was reported on from 4 to 8 days, and off Lower California on 9 days. In the Yellow Sea, with only a few reports available, fog was noted as encountered on at least 5 days.